

What is claimed is:

1. An electronic pulse generation device comprising:
an emitter element made of a dielectric material;
5 first and second electrodes formed in contact with
said emitter element;
means for applying alternating pulse between said
first electrode and said second electrode to reverse or
change polarization of said emitter element,
10 wherein electrons are emitted intermittently from said
emitter element.

2. An electronic pulse generation device according to
claim 1, further comprising:
15 a third electrode facing said emitter element;
means for applying positive direct bias voltage to
said third electrode;
wherein a vacuum space is present between said emitter
element and said third electrode, and electrons are emitted
20 intermittently from said emitter element toward said third
electrode.

- 25 3. An electronic pulse generation device according to
claim 1, wherein said emitter element is made of a
piezoelectric material, an anti-ferroelectric material, or
an electrostrictive material.

4. An electronic pulse generation device according to
claim 1, wherein said means for applying alternating pulse
applies a first voltage between said first electrode and
said second electrode for causing said first electrode to
have a potential higher than a potential of said second
5 electrode in a first period to perform said polarization of
said emitter element in one direction, and

10 said means for applying alternating pulse applies a
second voltage between said first electrode and said second
electrode for causing said first electrode to have a
potential lower than a potential of said second electrode
in a second period to perform said polarization reversal or
15 polarization change of said emitter element for emitting
electrons.

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20 5. An electronic pulse generation device according to
claim 1, wherein said first electrode and said second
electrode are disposed in contact with a principal surface
of said emitter element, with a slit defined between said
first electrode and said second electrode, said emitter
25 element being partly exposed through said slit.

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30 6. An electronic pulse generation device according to
claim 5, wherein polarization reversal or polarization
change occurs in an electric field E applied to said
emitter element represented by $E = Vak/d$, where d is a width
35 of said slit, and Vak is a voltage between said first

electrode and said second electrode.

7. An electronic pulse generation device according to
claim 6, wherein said voltage Vak is less than a dielectric
5 breakdown voltage of said emitter element.

8. An electronic pulse generation device according to
claim 1, wherein said first electrode is formed on a first
surface of said emitter element, and said second electrode
10 is formed on a second surface of said emitter element.

9. An electronic pulse generation device according to
claim 8, wherein polarization reversal or polarization
change occurs in an electric field E applied to said
15 emitter element represented by $E = Vak/h$, where h is a
thickness of said emitter element between said first
electrode and said second electrode, and Vak is a voltage
between said first electrode and said second electrode.

20 10. An electronic pulse generation device according to
claim 9, wherein said voltage Vak is less than a dielectric
breakdown voltage of said emitter element.

25 11. An electronic pulse generation device according to
claim 1, wherein said alternating pulse is applied between
said first electrode and said second electrode for causing
said first electrode to have a potential lower than a

potential of said second electrode to reverse or change polarization of at least a portion of said emitter element; and

5 the polarization reversal or polarization change induces emission of electrons in the vicinity of said first electrode.

10 12. An electronic pulse generation device according to claim 1, wherein said alternating pulse is applied between said first electrode and said second electrode to reverse or change polarization of at least a portion of said emitter element;

15 the polarization reversal or polarization change causes positive poles of dipole moments in the vicinity of said first electrode to be oriented toward said first electrode, inducing emission of primary electrons from said first electrode; and

20 said emitted primary electrons impinge upon said emitter element to induce emission of secondary electrons from said emitter element.

13. An electronic pulse generation device according to claim 12, wherein said first electrode, said emitter element, and a vacuum atmosphere define a triple point; and

25 primary electrons are emitted from a portion of said first electrode in the vicinity of said triple point, and said emitted primary electrons impinge upon said emitter

element to induce emission of secondary electrons from said emitter element.